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## Remarks

### Rejections Under 35 U.S.C. § 102(b)

#### *Structural Differences between the Briody '552 Patent and the Claimed Invention*

The Examiner rejects pending claims 22, 24, and 49 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,659,552 (Briody, 1972). Independent Claim 49, as amended herein, recites that the susceptor is "defined by a plurality of straight sidewall sections, each section having a planar surface, with said sidewall sections being connected at adjacent sides."

Briody shows a round, one piece unit (Figure 4; Col. 4, lines 8-17) and a susceptor formed of rings (Figure No. 1), but Briody fails to show adjacent, sidewall sections with planar surfaces as claimed. Having planar sidewall sections is useful in the claimed invention because the facing sections radiantly heat one another across an appropriately dimensioned space. Sidewalls having planar surfaces allow for direct alignment of the heating sections. The curved surfaces of the susceptor disclosed in the Briody '552 patent would not provide the linear, more direct heat path from one wafer pocket to another that the claimed planar sidewall sections advantageously present.

The Examiner disagreed with the Applicants' prior argument that Briody has curved sidewalls in a ringed drum configuration, as opposed to the Applicants' claimed straight, or as amended, planar sidewalls connected side to side. The Examiner cites Briody (Col. 1, Lines 49-50) as stating that the Briody susceptor has "recessed portions within its inner surface, with flat surfaces inclined at a small acute angle." The Applicants respectfully point out, however, that only the recessed pockets in the Briody '552 patent are described as flat. Briody is quite clear throughout the patent that the recessed portions have a flat backside, but that flat region has been carved out of a ringed susceptor with a rounded inner circumference. See Col. 1, Lines 49-50; Col. 2, Lines 47-50; Col. 3, Lines 22-23 and Figures 1-5. Those portions of the inner surface of the Briody susceptor other than the recessed pockets are, by definition, curved to form a ringed susceptor. In contrast,

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the pending claims recite planar sidewall sections in which the entire inner surface is flat, not just the recessed portions. The Applicants reiterate that the Briody susceptors do not show planar sidewall sections forming the body of the susceptor as claimed. The flat sections of the wafer pockets are insufficient to anticipate this element of the claim. The Briody susceptors differ from the claimed invention in regard to curved rings versus planar sidewalls, and the Applicants respectfully submit that the Examiner's 102(b) rejection is inappropriate in this regard.

Briody also shows ringed portions of the susceptor separated by vertical spacers (Figure 1, Reference No. 21). The presence of Briody's spacers negates any planar sidewall construction as claimed. In a second embodiment, Briody describes the susceptor as a hollow drum with pockets therein (Col. 4, Lines 8-13). The hollow drum has no sidewall sections at all. Briody's lack of any disclosure related to the sidewall sections with planar surfaces, as claimed, prevents the Briody '552 patent from anticipating the Applicants independent Claim 49 under § 102(b).

As explained above, the Briody patent does not include all of the structural recitations of the amended independent Claim 49. The Applicants respectfully request the Examiner to reconsider the rejection under § 102(b) in this regard.

#### Rejections under Section 103

The Examiner rejects Claims 22, 24, and 49 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,848,272 (Ohmura, 1989). The Applicants respectfully point to the fact that the Ohmura '272 patent provides no suggestion to form an apparatus with only one susceptor having sidewalls spaced to allow direct radiant heating of one another. The Ohmura '272 patent provides a susceptor within a susceptor; therefore, the outer susceptor of Ohmura's apparatus could not be dimensioned to provide the claimed unobstructed spacing between sidewalls of a single susceptor as recited in the claimed invention.

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The Examiner argues that removal of Ohmura's inner susceptor to make it simple would result in the claimed invention since both sides of the substrates would still be heated simultaneously. The Applicants respectfully disagree with the Examiner's conclusion. The Ohmura '272 patent has no disclosure regarding "radiantly and directly heat[ing] the exposed surface of a facing substrate wafer to substantially the same temperature as said susceptor portion heats a substrate wafer that is in one of said wafer pockets to thereby minimize or substantially eliminate radial and axial temperature gradients across a substrate wafer." In other words, Ohmura does not provide a susceptor that ensures an even temperature gradient across the front and back of each wafer and through the body of each wafer.

Ohmura discloses the susceptor within a susceptor to provide a uniform temperature distribution within the reaction chamber of a CVD apparatus and on the exposed surfaces of the wafers. Ohmura's opposed susceptors (Ref. Nos. 2 and 5) correct the temperature fluctuations within the reaction zone caused by an irregular gas flow and other conditions. (Ohmura, Col. 1, Lines 50-64) Ohmura is concerned with even temperature only within the reactive zone and, therefore, laterally across the exposed face of the wafer to provide high quality epitaxial growth. See Ohmura, Col. 1, Lines 40-64. The Applicants' invention provides an even temperature gradient both radially and axially throughout the wafer, not just within the overall reaction zone. This recitation of the independent Claim 49 is neither shown nor suggested by the Ohmura '272 patent.

The Examiner argues that it would have been obvious to exclude the inner susceptor of Ohmura without affecting the way the Ohmura device works. The Ohmura '272 patent, however, provides neither a motivation nor a reasonable expectation of success for removing the inner susceptor of the disclosed apparatus. Ohmura's disclosure addresses the problem of non-uniform gas flow within the susceptor hindering high quality epitaxial growth. (Ohmura, Col. 1, Lines 51-53) The Ohmura '272 design relies upon both susceptors rotating face-to-face to agitate the reaction gases. In this regard, the second, inner susceptor is required, pursuant to Ohmura's disclosure, to achieve uniform epitaxial growth. See Ohmura, Col. 4, Lines 38-47. Removing the inner susceptor, as

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suggested by the Examiner, would defeat one of the main purposes of the Ohmura '272 patent—mixing the reactant gases for improved epitaxial growth.

The Ohmura '272 disclosure fails to provide any teaching suggesting the single susceptor of independent Claim 49. The Applicants' invention could only be derived from the Ohmura '272 patent by the impermissible use of hindsight gathered from the Applicant's own disclosure. As such, the Applicants respectfully request that the Examiner reconsider the § 103 rejection herein.

The Examiner rejects Claim 50 as being obvious pursuant to the Briody '552 patent in view of U.S. Patent No. 4,579,080 (Martin, 1986). The Applicants addressed the same rejection in the immediately prior response and will not repeat that argument herein. The Applicants respectfully assert that the independent Claim 49 is allowable as discussed above. Dependent Claim 50 is likewise allowable upon these arguments.

#### Conclusion

The Applicant submits that the amended claims are in the appropriate condition for immediate allowance and respectfully requests the same.

Respectfully submitted,



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